

Indiana University – Purdue University Fort Wayne  
**Opus: Research & Creativity at IPFW**

---

Computer and Electrical Engineering Technology &  
Information Systems and Technology Senior Design  
Projects

School of Engineering, Technology and Computer  
Science Design Projects

---

12-11-2003

# Implementation of Security on a Wireless LAN Network

Ahmed H. Jafri

*Indiana University - Purdue University Fort Wayne*

Follow this and additional works at: [http://opus.ipfw.edu/etcs\\_seniorproj](http://opus.ipfw.edu/etcs_seniorproj)



Part of the [Computer Sciences Commons](#), and the [Engineering Commons](#)

---

## Opus Citation

Ahmed H. Jafri (2003). Implementation of Security on a Wireless LAN Network.  
[http://opus.ipfw.edu/etcs\\_seniorproj/23](http://opus.ipfw.edu/etcs_seniorproj/23)

This Senior Design Project is brought to you for free and open access by the School of Engineering, Technology and Computer Science Design Projects at Opus: Research & Creativity at IPFW. It has been accepted for inclusion in Computer and Electrical Engineering Technology & Information Systems and Technology Senior Design Projects by an authorized administrator of Opus: Research & Creativity at IPFW. For more information, please contact [admin@lib.ipfw.edu](mailto:admin@lib.ipfw.edu).

# **IMPLEMENTATION OF SECURITY ON A WIRELESS LAN NETWORK**

**by**

**Ahmed H. Jafri**

**December 11, 2003**

**for**

**Professor Paul I-Hai Lin**

**Professor Gary Steffen**

**Electrical and Computer Engineering Technology Department**

**Indiana University Purdue University at Fort Wayne**

**Fort Wayne, Indiana**

**EET 491 Senior Design and Analysis II**

## **ABSTRACT**

The following report contains all the pertinent information resulting from my Senior Design project. The purpose of the project was to show that there is insufficient security on wireless local area networks and to implement security on a wireless LAN network. The report contains research results, and a wireless local area network design and testing of security implemented on wireless networks.

## TABLE OF CONTENTS

	<b>Page</b>
ABSTRACT .....	ii
PREFACE.....	iii
LIST OF ILLUSTRATIONS.....	v
 I. INTRODUCTION.....	 1
Problem Topic.....	1
Background.....	1
Criteria & Parameters.....	1
Methodology.....	1
Primary Purpose.....	2
Overview.....	2
II. RESEARCH .....	3
III. NETWORK DESIGN.....	25
IV. TESTING & RESULTS.....	32
V. CONCLUSION.....	45
 Block Diagram.....	 46
References.....	48
APPENDIX A: Gantt chart.....	49
APPENDIX B: Cost.....	51
APPENDIX C: D-link Router Datasheet.....	52
APPENDIX D: D-link Wireless Card Datasheet.....	54

## LIST OF ILLUSTRATIONS

Figures	Page
1. LAN with more than two computers.....	3
2. Two computers interconnected over a wireless network.....	4
3. OSI Reference Model for a wireless LAN adapter.....	4
4. Access point connected with a broadband connection.....	5
5. Ad-hoc network.....	6
6. Infrastructure mode.....	6
7. Network authentication process.....	13
8. Message encryption using a substitution cipher.....	16
9. Message decryption using a substitution cipher.....	17
10. Shared-key authentication in WEP Protocol.....	23
11. Infrastructure mode .....	25
12. Router Login.....	26
13. Setting up your password.....	27
14. WAN settings.....	28
15. LAN settings.....	29
16. DHCP settings.....	30
17. WEP Encryption.....	31
18. Netstumbler 1.....	33
19. Netstumbler 2.....	34

20. Netstumbler 3.....	35
21. Netstumbler 4.....	36
22. Netstumbler 5.....	37
23. Netstumbler 6.....	38
24. Ethereal 1.....	39
25. Ethereal 2.....	40
26. Ethereal 3.....	41
27. Ethereal 4.....	42
28. Ethereal 5.....	43

<b>Tables</b>	<b>Page</b>
1. Popular 802 wireless standards.....	10